ORISE Support of Lower Umatilla Groundwater Management Area and EPA SSWR research

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Background: Across the United States, approximately 15% of all people use domestic wells for drinking water, but there are no federal laws or programs to monitor the quality of private wells comparable to the Safe Drinking Water Act provisions for public drinking water supplies. Approximately 16% of Oregon's populations consumes water from domestic wells. To protect groundwater quality in the state, Oregon Department of Environmental Quality (ODEQ) has established three Groundwater Management Areas (GWMAs), all due to widespread nitrate contamination largely associated with agricultural nitrogen use and management. Nitrate can cause as number of human health problems, including certain cancers. The Lower Umatilla Basin (LUB) contains one of these three GWMAs where groundwater nitrate contamination remains an issue.

Description: The ORISE participant would work with EPA and DEQ to construct a quantitative nitrogen budget for the LUB GWMA, using methodologies from previous work at EPA. The nitrogen budget will account for natural and anthropogenic nitrogen sources to the area, using data from the USGS watershed model SPARROW (Spatially Referenced Regressions on Watershed attributes) for nitrogen inputs and stream fluxes.

ORISE Learning Outcomes: With guidance from their mentor, the research participant will have the opportunity to: collaborate with multiple government agencies (EPA, USGS, Oregon DEQ and Oregon Department of Agriculture [ODA]); work with the Pacific Ecological Systems Division in Corvallis Oregon; assemble and analyze datasets; work with agricultural datasets for the LUB area; be involved in sharing and vetting data with the LUB agricultural community; and collaborate on scientific analyses and/or presentations. This is an opportunity to learn about environmental data management and analysis as it relates to the impacts of nonpoint pollution resulting from agriculture and connections to source water protection.

Skills required: We seek an ORISE participant with data management, statistical analysis, and spatial analytical skills to be involved in efforts to assess nonpoint source pollution impairments to water quality.

Begin/End Dates: As soon as possible, continuing 6-12 months with possibility of expansion if additional work develops from interactions with ODEQ and ODA.

Projected Number of Hours/Week: 20